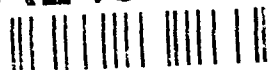


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DETERRENCE FOR WORLD PEACE: A NEW WORLD ORDER OPTION?

BY

Lieutenant Colonel Michael J. Rosso, Jr
United States Air Force

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USAWC MILITARY STUDIES PROGRAM PAPER

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DETERRENCE FOR WORLD PEACE: A NEW WORLD ORDER OPTION?

AN INDIVIDUAL STUDY PROJECT

by

Lieutenant Colonel Michael J. Rosso, Jr.
United States Air Force

Colonel Stephen D. Sheehan
Project Adviser

U.S. Army War College
Carlisle Barracks, Pennsylvania 17013

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ABSTRACT

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The recent collapse of the former Soviet Union has brought an end to the Cold War and a beginning to change and uncertainty. The shift from a bi-polar to a multi-polar world has uncovered trends that make the future of the new world order complex and dangerous. The rise in regional conflicts, proliferation of weapons of mass destruction, accelerated worldwide technology transfer, and the disposition of some 30,000 nuclear warheads in the Commonwealth of Independent States are but a few of the major trends that can have a profound effect on world peace if not controlled. To solve this problem of control will bring a new emphasis to the word 'deterrence.' For 45 years the word 'deterrence' has been most commonly used to describe the justification for a nuclear arms race between the United States and the former Soviet Union. Now, the global community of nations can 'deter' further proliferation of weapons of mass destruction by using the recommended three-part solution of a global nuclear test ban, worldwide acceptance of the Global Protection Against Limited Strikes (GPALS) system, and arms control enforcement using embargoes and economic sanctions by an international system like the United Nations.

Third World countries acquiring or trying to acquire ballistic missiles, nuclear weapons, chemical weapons, and biological weapons

Country	Ballistic Missiles	Nuclear Weapons	Chemical Weapons	Biological Weapons
Afghanistan	Yes	-	-	-
Algeria	Yes *	-	-	-
Argentina	Yes	Possible	Possible	-
Brazil	Yes	Possible	-	-
Burma	-	-	Likely	-
Cuba	Yes *	-	Possible	-
Egypt	Yes	-	Likely	-
Ethiopia	-	-	Likely	-
India	Yes	Yes	Likely	-
Indonesia	Planned	-	Possible	-
Iran	Yes	Possible	Likely	-
Iraq	Yes	Possible	Yes	Likely
Israel	Yes	Yes	Likely	-
Korea, North	Yes	Possible	Likely	Likely
Korea, South	Yes	-	Likely	-
Kuwait	Yes *	-	-	-
Libya	Yes	Possible	Likely	-
Pakistan	Yes	Likely	Likely	-
Saudi Arabia	Yes	-	Possible	-
South Africa	Yes	Likely	Possible	-
Syria	Yes	-	Likely	Likely
Taiwan	Yes	-	Likely	Likely
Thailand	Possible	-	Possible	-
Vietnam	Possible	-	Likely	-
Yemen	Yes	-	-	-

* Short-range (less than 100 kilometers) missiles only

Table 1

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INTRODUCTION

The concept of deterrence--the use of threats to induce an opponent to behave in desirable ways--has existed throughout history. It was not until the onset of the nuclear era that the concept of deterrence received systematic theoretical study. In particular, the American decision to drop the atomic bomb on Hiroshima in August 1945 produced a revolutionary change in military strategy. Because of the absolute destructiveness of this new weapon, the goals of strategy shifted from efforts to win wars most effectively to a means for preventing wars.¹

Although deterrence has generally proved to be a successful strategy and direct confrontation between the superpowers has been avoided, the current rise in the number of regional conflicts and the steady rise in the number of Third World countries possessing or trying to possess ballistic missiles capable of carrying chemical, biological, or nuclear warheads are indicators that it is time for change. It is time to shift this country's focus away from the idea of global confrontation, and to begin a worldwide effort to bring about an arms control agreement that will produce and maintain world peace.

DISCUSSION

To begin the discussion, one must accept the fact that

controlling the possession and use of weapons of mass destruction for the overall goal of world peace is no easy task. The difficulty is that the justification for possession of a deterrent weapon is based on perception. No country will ever willingly give up a weapon that they perceive will deter an enemy attack, perceive to be a means of upgrading their war-fighting capability, or perceive to be a symbol of status and international prestige.

Weapons of mass destruction are defined as those weapons capable of carrying chemical, biological, or nuclear warheads. Although delivery platforms for such weapons may include ballistic missiles, aircraft, or artillery, this discussion will simplify the definition and categorize ballistic missiles capable of carrying chemical or biological warheads as one type weapon, and ballistic missiles capable of carrying nuclear warheads as another weapon.

Chemical and Biological Weapons

Once the technology of ballistic missiles has been gained by a nation, the historic sequence in creating a more deterrent weapon is to replace the conventional warhead with a chemical or biological warhead. Relative to nuclear material, the production and storage of chemical and biological agents are extremely easy and low cost. The space needed to manufacture such agents is no

bigger than the size of a desk top, and the production of such toxic substance can easily be hidden in commercial factories such as those used to produce pesticides. Since there is little or no need to openly test this capability--simply possess the technology for a warhead capable of carrying it to the target--it is extremely difficult to determine which specific countries have a chemical or biological capability, unless they have used such a weapon in previous conflicts.

If a nation perceives its chemical or biological weapons are a deterrent over purely conventional armies, or armies with a lesser capability, it may threaten to use these weapons to gain an advantage and achieve its objectives. One can only assume that if a nation has the technology to produce a ballistic missile, it may have the capability of delivering chemical or biological weapons with very little advanced technological effort.

Nuclear Weapons

The importance of an arms control agreement for the purpose of world peace can be seen in the efforts of the U.S. and former Soviet Union in 1991. Two countries that together possess the world's largest arsenal of nuclear weapons, capable of annihilating each other's retaliation capability, were willing to come to an agreement that would assist in the search for world

peace by dramatically reducing their total number of nuclear weapons.

In a surprise announcement on 25 September 1991, President Bush took the boldest steps to date toward nuclear disarmament. In a sweeping series of moves, President Bush reduced the U.S. nuclear arsenal and the alert posture, and invited the Soviets to reciprocate. The following is a summary of the U.S. efforts:

- The Strategic Air Command's bombers (approximately 40) were taken off nuclear alert for the first time in decades.

Development of the new SRAM-2 air-to-ground missile was canceled and production of the advanced cruise missile was capped at 640 missiles instead of the originally planned 1,461.

- The 450 Minuteman-2 intercontinental ballistic missiles (ICBMs), scheduled to be dismantled under the START treaty, were taken off alert. Once START is ratified, the U.S. will move faster than the treaty requires to destroy the missiles.

- All ground-launched tactical nuclear weapons were ordered to be withdrawn to the U.S. and destroyed. (There are 1,700 in Europe, 400 in the U.S., and about 50 in Korea. The weapons in Europe include 1,300 artillery shells and 400 Lance missile warheads.) No specific timetable was set, and air-delivered tactical nuclear weapons are to be retained.

- All naval tactical nuclear weapons (about 100 Tomahawk

missiles and 900 aircraft bombs, including air-dropped nuclear depth charges) were ordered to be withdrawn to storage facilities. About half will be dismantled.

- All U.S. mobile missile programs were canceled. The only surviving missile program (Midgetman) is restricted to fixed launchers, and the Soviets were invited to cancel all of their missile programs except for one single-warhead design.

- The B-2 bomber program (for conventional missions) will continue, as well as the Strategic Defense Initiative (SDI) program.

- U.S. Air Force and Navy strategic nuclear weapons would be grouped under a single unified command (Strategic Command).

The Soviet reaction was understandably cautious, and former President Gorbachev did not issue a formal reply until 2 October 1991. In summary, his announcement stated the following:

- All ground-based tactical nuclear weapons (artillery shells, short-ranged rockets, and mines) would be destroyed. Nuclear anti-aircraft weapons will be stored or destroyed.

- All naval tactical weapons, including those of Naval Aviation, would be removed and stored or destroyed.

- Negotiations should begin on tactical nuclear aircraft bombs.

- The Soviets would remove 1,000 more strategic weapons than

required by the START treaty over its seven-year course. He also called for another 20% cut in strategic weapons.

- He declared a unilateral moratorium on nuclear testing.
- Rail-mobile and road-mobile missiles were returned to garrisons. Work on a new small mobile missile will stop. New launchers for larger missiles will not be deployed.
- Strategic bombers were taken off alert. Work on a new short-ranged air-launched nuclear missile will stop.
- Alert status for 134 multiple-warhead and 369 single-warhead intercontinental missiles will be canceled.
- All strategic nuclear weapons will be put under a single command.²

Just as the superpowers were beginning to get on the same track about the control and disposition of nuclear weapons, through an arms control agreement, the Soviet Union collapsed. With the collapse of the Soviet Union came the rise of independent Soviet states--referred to hereafter as the Commonwealth of Independent States (CIS)--and many unanswered questions about the future of nearly one half of the world's nuclear weapons.

The former Soviet Union military threat has changed but has not disappeared. As the CIS continues to struggle over internal political and economic problems, much of the outside world's

interest in this turmoil seems to be centered around the former Soviet military. What was once the Soviet Union's military equipment, supplies, and personnel, is now being claimed by her independent states. Naval war ships, fighter and bomber aircraft, and enormous numbers of tanks, mobile missiles, artillery, air defense equipment, and even ICBM silos and its contents are being claimed as ownership because of where the equipment is geographically based. No concern, however, is as great as that of the former Soviet Union's nuclear weapons arsenal.

The disposition of some 30,000 Soviet nuclear warheads becomes a tremendous worldwide security concern and can be broken down into two separate problems--strategic and tactical. The vast bulk of the Soviet's 22 long-range ICBM fields are located inside the Russian republic. The exceptions are a small number of missile fields in the independent republics of Ukraine and Kazakhstan. A small handful of the Soviet's strategic bomber bases are also located outside the Russian republic--in Kazakhstan, Byelorussia, Ukraine, and Estonia.³ There are, however, strategic nuclear warheads prepositioned at these locations.

The process of launching a Soviet nuclear ICBM and a strategic bomber nuclear weapon is similar to the procedures used in the United States. The weapon can only be armed if the correct

codes for the electronic keypunch lock, known in the U.S. as Permissible Action Links (PALs), are manually typed into the weapon before launch. The codes, however, are currently held by the president of the Russian republic, Boris Yeltsin. He was given these codes by the leader of the former Soviet Union, Mikhail Gorbachev. The codes are highly classified and are usually disseminated only in time of war. Therefore, even if future chaos resulted in some mad clique gaining control of a Soviet missile silo or a strategic bomber weapon, they would, in theory, be physically unable to launch the weapons without the authorization codes held at the highest level.*

Not much is known about safeguards on Soviet submarine-launched ballistic missiles. Since other procedures for strategic nuclear weapons are similar to those of the United States, one can assume the Soviet procedure to launch such a weapon involves several complicated steps by several people and therefore should be discounted as a viable threat to Soviet or world peace.

Soviet tactical nuclear weapons, on the other hand, are stored throughout the CIS and pose the biggest threat to safeguard procedures and ultimately world peace. Although Soviet leaders are doing much to safeguard and transfer these weapons to the Russian republic, a nuclear stockpile of 25,000 to 32,000 explosives will take some time and involves risk. Several

possible scenarios might result from this volatile situation.

One such scenario is that the CIS could suddenly break up into a number of totally independent states armed with nuclear weapons. If a large Soviet republic like Ukraine or Byelorussia would break off from the CIS and control nuclear forces now in its territory, this would make each of them the nuclear equal to France or the United Kingdom.⁵

Another scenario might be that local nationalist or terrorist groups might seize Soviet nuclear weapons and transfer or sell them to another country or even other terrorist groups. An example of this could be that Muslim radicals in any one of the five Soviet central republics--Kazakhstan, Turkmenistan, Uzbekistan, Tadzhikistan, and Kirghizia--might one day seize nuclear weapons and transfer or sell them to a neighboring Muslim state like Iran or Iraq. Today, there are 157 major terrorist organizations headquartered in 49 countries, plus dozens more smaller bomb-throwing groups in the Middle East and elsewhere in the world at large. As of September 1991, some 24 Third World countries had deployed or were working on chemical weapons, 16 on biological weapons, and 15 others had acquired or were seeking nuclear weapons.⁶

A third scenario, perhaps the most likely to occur, is that of local nationalists seizing nuclear weapons in order to

blackmail Moscow leaders into cooperating with the secession attempt by a republic or a national group. This scenario almost became a reality in 1990, when Moslem separatists, opposed to Soviet rule in Azerbaijan, attacked a Soviet nuclear weapons storage facility just south of Baku, the capital of the republic. Although beaten back by Soviet troops in the ensuing fight, this was a near miss. According to one U.S. intelligence official, "Armed dissidents almost captured a nuclear weapon." 7

From a global perspective, the collapse of the former Soviet Union has created an emergence of a multi-polar world. Not only is there instability in the CIS, there is a heightened awareness of other world regional instabilities (Arab-Israel, India-Pakistan, North Korea-South Korea) that has brought to light a thirst for nuclear weapons as a symbol of power and regional dominance.

The gap between the military superpowers and other military nations is becoming more narrow. Ballistic missiles reduce distances between nations, and nuclear warheads multiply power. One of the biggest threats to world peace is the uncertainty associated with the realization that 'in-house' technology is no longer necessary for a nation to possess advanced weapons. Ballistic missiles and nuclear weapon technical expertise can and are being sold on the world market. Possession of such

capabilities by relatively small, peripheral, and backward nations will allow them to emerge rapidly as both regional and world threats to global security. Some 20 nations now have ballistic missiles capable of carrying nuclear warheads, and in less than a decade that number could grow to 25. (Table 1)*

Middle East

An arms race has existed in this part of the world for quite some time. Although Israel's development of a nuclear weapon capability created greater competition among regional members, a recent increase in the use of high-tech weapons and the heightened political and ethnic tension between Israel and Arab governments has sparked an even stronger desire for members to achieve regional military dominance.

High-tech systems capabilities made their mark in Desert Storm. Stealth technology, laser-guided weapons, and night vision capabilities created a distinct advantage over the Iraqi military. With the use of real-time media coverage by Cable News Network (CNN), all the world witnessed high-tech pin-point accuracy and destruction capability that made the war seem one sided. It is only a matter of time before these capabilities find their way into Middle East militaries and become a catalyst for an arms race that can only lead to advances in ballistic missile technology.

An arms race coupled with political and ethnic instability is a volatile situation. If one side believes that war is inevitable, it may try to preemptively destroy the other side's offensive weapon capability. Even if both sides prefer not to preempt, each may fear that the other will; consequently, both may decide to launch at the first (perhaps false) indication of an attack. This crisis-stability problem is even worse in the Middle East because warning of an attack will be less, due to short distances between countries, and much less reliable because of the limited intelligence-gathering capabilities. In time, the possession of high-tech weapons and conventional ballistic missiles will most probably escalate into chemical and biological weapons, and then to nuclear weapons as the ultimate weapon of power.

Currently, Israel has two nuclear reactors, one five-megawatt IRR-1 reactor at Nahal-Soreq and one even larger IRR-2 reactor at Dimona. The reactor at Dimona is widely believed to produce plutonium for nuclear weapons; some experts estimate that Israel may have an arsenal of 50-100 weapons, either immediately available or ready to be assembled.* Iraq had a significant nuclear weapons program underway prior to Desert Storm, and Iran and Libya are suspected of having a strong interest in acquiring nuclear weapons also. Even though Israel is the nuclear monopoly

in the Middle East, it is not likely that they would be willing to give up their deterrent at a time when Iraq is rebuilding its high-tech chemical and long-range missile capabilities and also trying to produce a nuclear weapon. The arms race for regional dominance can only get worse. From a political point of view, until the Arab governments accept the existence and legitimacy of the Jewish state, Israel will continue to feel that its existence is threatened and its nuclear arsenal is vital.¹⁰

India-Pakistan

Both India and Pakistan already have aircraft that are capable of delivering nuclear weapons to targets inside each other's territory, and missile technological advances in both nations are strengthening these rival delivery systems. A subcontinental ballistic missile race seems to have broken out.¹¹

Pakistan, whose initial space-related efforts were mainly limited to launching rockets from a range near Karachi, tested two short-range ballistic missiles, Haft-1 and Haft-2, in February 1989. There was much press written about this event and it is believed that Pakistan had received most of the design and technological assistance from its close ally, China.¹²

India test-launched its first intermediate-range ballistic missile, the 1500-mile-range Agni, in 1989. Within a year, a

shorter-range ballistic missile, the Prithvi, was successfully test-fired. Both the Agni and the Prithvi have the capability to carry nuclear warheads.¹³

The relationship between India and Pakistan is easy to follow and understand until China enters the picture. Since China is already an established nuclear power, it acts as a catalyst in a three-way triangle that can only heighten the desire for nuclear weapons and regional dominance. China believes that India will remain "one of its most likely foes over the next couple of decades."¹⁴ Pakistan has a far smaller nuclear program and a lesser capability to produce weapons-useable fissile materials than India, a gap that is expected to widen further in the 1990s, but it continues to build a small nuclear deterrent against the perceived threat of India. On the other hand, India has retained its nuclear capability primarily to counter what it perceives to be the intimidating nuclear might of China, but has accelerated its nuclear program because of Pakistan's nuclear weapons capability.

Korea

The Korean peninsula and its potential for regional instability remains an area of great concern. It is not known for certain whether North Korea has a nuclear capability, but all indicators are that it is making every effort to do so. The North

Koreans have said they will not permit international inspection of their nuclear facilities as long as U.S. nuclear weapons are stored in South Korea. North Korea has refused to allow a nuclear inspection team to enter the country even under the terms of the international Nuclear Non-Proliferation Treaty.

President Bush's announcement to withdraw all ground-launched tactical nuclear weapons to the United States and have them destroyed, may very well call the bluff of the North Koreans. If U.S. nuclear weapons are sent home from overseas bases, North Korea will no longer be able to cite American weapons as a reason to bar inspections.

North Korea, according to Western analysts who watch the country via satellite photos, has a reactor capable of producing nuclear weapon fuel. The nation evidently does not have nuclear weapons yet, but it is building a nuclear-fuel enhancement plant that would accelerate its progress toward creating a nuclear weapon.¹⁵ Striving to possess nuclear weapons, isolation in the emerging world order, and continuing to increase its military strength all point to the need for vigilance in this region.

Other Concerns

Looking at just a few potential regional conflicts does not tell the whole story, nor does it show the total seriousness of an arms race and its threat to world peace. The overall Third

World ballistic missile proliferation, in particular, poses a more complex challenge to the security interests of the U.S. than did the arms race with the former Soviet Union. At present, more than 20 Third World nations have some type of ballistic missile capability either in operation or under development. The concern is that the number of such countries and the capabilities of their weapons systems will increase over the next decade.

The possession of ballistic missiles is seen by many Third World countries as a powerful international status symbol, as the acme of national power, and even as a rite of national passage out of technological backwardness.¹⁶ Saudi Arabia, for example, seems to have acquired missiles more for the prestige of having them, rather than as an attempt to match its military requirements with available systems. Saudi Arabia began by trying to acquire Lance missiles with a 100 KM range from the United States, but ultimately purchased the Chinese CSS-2 with a 2500 KM range because China was the only one willing to sell to the Saudis. The disparity in the capabilities of these two systems suggests that operational considerations played a much smaller role in Saudi decision-making than the sheer importance of having at least some kind of ballistic missile capability.¹⁷

China is also reportedly marketing its 180-mile M-11 missile to Pakistan (complete with mobile launchers) and its 375-mile-

range M-3 missile to Syria and possibly to Iran.¹⁸ U.S. intelligence sources reportedly believe the Chinese are secretly building a nuclear reactor for Algeria capable of producing plutonium for nuclear weapons, and that China has supplied Pakistan the complete design of a tested nuclear weapon with a yield of about 25 kilotons.¹⁹ Sources also estimate that by the year 2000, at least six countries in the Third World will have ballistic missiles with ranges of 1800 to 3300 miles.²⁰

Ballistic missiles armed with conventional warheads are not much of a deterrent in war. Although there are some that would argue that Iraqi Scuds fired at Israeli populations in the Gulf War created a short-term panic, the overall effectiveness militarily was minimal. The fact that conventional weapons lack deterrence seems to be well understood, since many countries are actively pursuing nuclear, chemical, and biological weapons.

Nuclear weapons are the most difficult to acquire; the required technology to produce and store nuclear material is expensive and current export controls on nuclear material and waste are somewhat effective. Chemical weapons, on the other hand, are much easier to obtain and could kill as many people as dozens or even hundreds of conventionally armed missiles. Biological weapons are more difficult to produce than chemical weapons, but are more unpredictable in their effects and could

inflict casualties on the scale of small nuclear weapons. Therefore, it should not be surprising that the future of ballistic missile proliferation, at least initially, points in the direction of chemical and biological weapons. For many Third World countries these are the only weapons that could constitute a strategic threat or a strategic deterrent.

SUMMARY

There are at least five good reasons why the U.S. should be concerned about the Third World's eagerness to possess ballistic missiles that can carry chemical, biological, or nuclear warheads: (1) possession of these weapons can greatly complicate U.S. foreign policy; (2) regional crisis instabilities are likely to be more severe; (3) the probability of inadvertent or accidental use of such weapons is likely to be greater in regional conflicts because distances between countries are shorter and attack warning-time is less; (4) transfers to terrorist or sub-national groups are more likely; and (5) at least some of the future possessor countries are likely to be politically unstable, aggressive, not have the same value for human life, and therefore would be difficult to deter.

The United States has had a solid declaratory policy of preventing the proliferation of weapons of mass destruction--whether they be nuclear, chemical, or biological--but seems to

have had this policy overshadowed in the past by world events or its own interests. This shift in priorities resulted from trying to balance the goal of nonproliferation against other goals of U.S. policy such as containing the former Soviet Union, hunger and starvation in underdeveloped countries, international drug trafficking, global environmental clean-up, or balancing the trade deficit. In most cases nonproliferation has taken a back seat to other U.S. interests. It is time to give nonproliferation of nuclear, chemical, and biological weapons the highest possible priority.

SOLUTION

Arriving at a solution to such a complex problem as the global control of nuclear, chemical, and biological weapons is no easy task. If all the world's weapons of mass destruction were destroyed tomorrow, the technology would remain and at some point in the future these weapons, or some variant thereof, would inevitably be created again. Because of this, the most desirable solution of total elimination of all weapons of mass destruction becomes the one least likely to occur. Therefore, to arrive at a solution to this problem, one must begin with a premise that these deadly weapons are here to stay.

One seemingly logical solution would be to arrive at a global consensus of an acceptable level of such weapons for the

security stability of each nation. Although this seems fair, it would undermine the perception of deterrence. Given a conflict between two nations of equal military strength, what becomes a deterrent is the size of the warhead or the number of weapons possessed by one nation compared to the other. If a cap on the total number of weapons was established, nations would soon find ways to hide capabilities and cheat the system. Similar to the U.S. and former Soviet Union nuclear arms race, the final objective of those nations desiring a deterrent would be to possess enough weapons to totally annihilate its opponent or possess enough weapons for a 'first strike' capability that would render the opponent's retaliation capability useless. An arms race of this magnitude would threaten world peace and do little more than drain the economy and risk the collapse of its existence from within. Something must be done now to control the spread of these weapons.

President Bush's nuclear arms reduction speech in September 1991, did a great deal to initially reduce the number of nuclear weapons between the U.S. and the former Soviet Union, but did nothing for the nuclear proliferation in the Third World countries. If the logical progression for the ultimate desirable weapon is from conventional ballistic missiles to chemical or biological weapons and finally to nuclear weapons, we must take

steps now to slow this process down, or better yet, interrupt this process by making development penalties so severe it discourages the continuation process. The proposed solutions that follow are not independent entities, but solutions that should be used in concert with one another to achieve and sustain world peace.

Nuclear Test Ban

The current nonproliferation regime is based on discrimination between nuclear 'haves' and 'have-nots', a situation the 'have-nots' reluctantly accepted when the nuclear powers pledged to control the arms race. For the United States, CIS, France, Great Britain, and China to insist their security depends not only on possessing a vast arsenal of nuclear weapons, but to continually test and develop new varieties, sends the wrong message to the non-nuclear-weapon states. If the message is that nuclear tests bring about critical security benefits--they are only encouraging other countries to follow their example.

Consider the nuclear "threshold" states: Israel, India, Pakistan, South Africa, Brazil, Argentina, Iraq, and South Korea. The first six have refused to sign the Nonproliferation Treaty, because of its inherent discrimination between the nuclear 'haves' and 'have-nots', but all are parties to the nondiscriminatory Limited Test Ban Treaty.²¹

Simply signing a global test ban treaty does not guarantee that all parties will adhere to its written contents, verification must also be a part of the process. Verifying a comprehensive test ban requires a global monitoring system capable of detecting explosions in the atmosphere, in space, underwater, and underground. Tests everywhere but underground are already prohibited by the Limited Test Ban Treaty, and can be monitored with high confidence by satellites and acoustic sensors used for antisubmarine warfare. Underground nuclear tests, however, pose the most serious monitoring problem because they must be detected and identified.

The main tools for monitoring underground explosions come from seismology, which is the study of earthquakes and related phenomena. The equipment used in seismology is a series of ground-based stations that receive and record seismic waves produced by underground nuclear explosions. Background noise such as strong winds, ocean waves, and even every-day traffic can affect the reliability of the system, but depth and location of the seismic wave creates a footprint that can distinguish between an earthquake and a small nuclear explosion. The Soviets report that their seismic station at Borovoye can detect and record nuclear underground explosions from the U.S. Nevada test site starting at a fraction of a kiloton.²²

Compliance with a global test ban treaty can never be verified with 100 percent certainty. There will always exist some chance that clandestine testing may occur below the monitoring threshold. If we strengthen the international nonproliferation regime, create an international seismic station network, and allow for unannounced on-site inspections of test sites, we can take the first big step toward nuclear nonproliferation and the security of world peace.

GPALS

The world cannot be made a peaceful place by simply one event. A huge step can be taken in that direction by combining the proposed nuclear test ban with the Global Protection Against Limited Strikes (GPALS) system. GPALS is the current version of the U.S. Strategic Defense Initiative (SDI) that can respond to regional security threats by protecting against accidental, unauthorized, or irresponsible Third World ballistic missile launches. The performance during Desert Storm of the Patriot PAC-2 has spurred confidence in GPALS feasibility. It is believed that with approved Congressional funding, deployment of GPALS' space-based components could probably begin by the late 1990s--just about the time Third World countries are expected to be acquiring intermediate-range ballistic missiles and nuclear weapons.²³

The SPALS system is a focus on protection more so than deterrence. The current system would consist of surface- and space-based components to ensure continuous global detection, track, and intercept of up to 200 ballistic missiles, including theater missile threats. Surface-based interceptors would provide regional point and area defense, while space-based interceptors (Brilliant Pebbles) would provide interdiction capability against missiles with ranges in excess of 600 kilometers (approximately 370 miles). The near perfect hit-to-kill technology for interception of all types of warheads--nuclear, chemical, biological, and conventional--would permit destruction of both missiles and warheads well away from the targets being defended.²⁴

Managing the global defense system against ballistic missiles will be a full-time mission in peace and in war. The United States and certain states within the CIS that have the technology, could share in the operation, maintenance, and sustainment of the global system. Costs to operate this system would be shared by the partners of the international alliance that's formed. Just who will manage this system overall raises an interesting and important question.

One possible solution is to put this system under international operational control. The United Nations is a

possible solution, but because of its size the decision-making process may be slowed and a time-critical solution for world peace may be lost if the global system were under their control. Giving NATO the responsibility at a time when they are looking for a mission may be a possibility also, but NATO by itself would not be a good choice because it might be regionally focused. The best possible solution would be, at least initially, to have one international alliance subdivided into three headquarters, one from each of the ballistic missile power regions of Europe, Asia, and the Middle East. Recognizing the historic role that NATO (including the U.S. and Canada) has played in Europe of maintaining stability and world peace for so many years, would logically make them leaders of the ballistic missile alliance (BMA). A regional approach to the BMA would put regional ethnic, religious, or economic pressure on those states that would be reluctant to sign or did not comply with the written treaty. Having three voting regional headquarters would also ensure that a stale-mate would not occur when voting for world peace issues. Since ballistic missile capabilities are the basis of the BMA, discussing the control of 'outgrowths' of this weapon system (like cruise missiles) in the present would eliminate their proliferation in the future.

Since ballistic missiles appear to be the future 'weapon of

choice' in regional conflicts, as was demonstrated in Desert Storm, a system like GPALS is technically and conceptually valid. The fact that mobile ballistic missiles are difficult to locate and destroy and are also a future trend, may make the GPALS system and the proposed alliance the only effective means to deter or counter this threat.

Economics

The third element and perhaps the most logical solution to global collective security against weapons of mass destruction is economics. With the recent shift in world-power status from military powers to economic powers, new economic relationships have formed among new economic powers, particularly in Europe and Asia. The global community now has a chance to create a new world order united by economics. The economy is the life-blood of any nation and without it a nation can not exist. An example of this would be the recent Soviet system's collapse that was precipitated by economic failure. Economic stability at the local, state, or international level is the basis for the third and final proposal for world peace.

The worldwide movement toward financial market reliance continues to gather momentum. If we look at the former Warsaw Pact countries of Poland, Hungary, and Czechoslovakia--that were once closed to the outside world--we find that since 1989, Poland

has created about 6,000 joint ventures with other nations, Hungary has 11,000 joint ventures, and Czechoslovakia has about 4,000.²⁵ This economic interdependence is occurring all over the world.²⁶

Outcomes of international problems generally depend on bargaining, and bargaining depends on the balance of interdependence in a relationship. If the concerns of nuclear weapons and weapons of mass destruction were elevated to an established international system like the United Nations, it would provide an outstanding forum to seek world peace objectives. As regional and global economic interdependence grow, so would the effectiveness of embargoes and economic sanctions against those nations who do not comply with the United Nation's demands. Arms control negotiations would no longer be conducted between two nations, they would be conducted on a global level where a regional security issue becomes a global issue for world peace.

CONCLUSION

As stated before, there is not any single solution to the new world order problem of how to control the desire of several nations to ultimately possess and use weapons of mass destruction. This paper provides a roadmap to initiate and develop--through a global nuclear test ban, worldwide support of

the GPaL system, and use of the United Nations as a world economic arbitrator--an effective and necessary path toward world peace. By using these proposals in concert with one another the global community of nations can collectively discourage nations from attempting to possess weapons of mass destruction, or dissuade one's potential enemy from starting a war and using such weapons, by making it self-evidently clear that his war aims cannot be attained or the cost would be too great, no matter what the level of conflict--that's 'deterrence.'

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